

decompose; the danger of fire is increased, the burning bridges cause wrecks of trains. In the Arabian deserts the railroad operators suffer comparatively little from disease. On the Transcaspian road the lack of good water brought about disease. On the Iquique road it is necessary to convey water in tanks and in some cases distilled water was carried 40 miles on mules.

In regions of high altitude the rarefaction of the air causes much trouble to the operators, but on the other hand the absence of germs prevents the decay of organic matter. In the report of work on the railroad up the Jungfrau, Dr. Kronecker stated that mountain sickness sets in at altitudes varying with different persons, but that it attacks all persons as soon as they indulge in the least muscular effort above 10,000 feet. Persons in good health can stand being passively transported up to 12,000 feet without inconvenience; a prolonged sojourn may, however, be disastrous. On the Callao, Lima, and Oroya Railroad many thousands of laborers lost their lives. "So difficult was it to work in the rarefied air at high altitudes that riveters did not average a week's work each and many returned on the next train." On the other hand, in building the Sierra Leone Railroad the number of deaths and invalids was wonderfully low, but the climate had an enervating effect and there were frequent absences on leave. In the upper portions of the railroads, such as the Jungfrau, snow avalanches are a serious obstacle but may be avoided by burrowing under or by underground tunnels. Many railroads are abandoned during the snow season. Not only in Switzerland but also in the Rocky Mountain region snow sometimes overpowers all human efforts.

In regions of severe winter cold another class of obstacles is met with, namely, the formation of ice. Although deep and frozen rivers and lakes may be traversed by railroads, yet when the breakup comes in springtime there is a period when such transportation must cease and when boats also are impossible. The experiences of the Transsiberian road and the Canadian Pacific are given with some detail. The average number of days during which work is possible on account of the snow and ice and the frozen ground is very limited. At Lake Baikal the soil is unworkable from October to April; at Vladivostock, the number of days when the temperature is below freezing is 150, and, in general, on the Transsiberian railroad the total number of working days in a year is about 100. A general tabulation of the number of working days in each month of the year, for various portions of the United States, would perhaps elucidate many of the problems relating to the labor question.

METEOROLOGICAL EXPEDITION TO THE BAHAMAS.

The Geographical Society of Baltimore, which has been organized and developed through the efforts of Dr. George B. Shattuck and of which Dr. Daniel C. Gilman is President, has organized an expedition for a scientific survey of the Bahama Islands. This expedition will sail on Monday, June 1, from Baltimore for Nassau and other points in the Bahamas. There are about twenty-five scientific members of the party. The vessel, *William H. Van Name*, a schooner of 97 tons, 100 feet long, 26 feet wide, and 9 feet draught, has been chartered, with a special crew, under Capt. C. D. Flowers. The general expenses of the expedition, amounting to about \$6000, have been defrayed by contributions from the Geographical Society of Baltimore, the Johns Hopkins University, the Coast and Geodetic Survey, and, especially, the Governor of the Bahamas, Sir Gilbert T. Carter, who will accompany the expedition. A great variety of scientific work is provided for, such as the culture of bacteria, the study of mosquitos and malaria, the observation of marine life at great depths through panes of plate glass inserted in the bottom of a dory. A monument

will be established as a bench mark, to which the mean sea level can be referred, and any change in the altitude of this monument above mean sea level will indicate the rising and falling of the earth's crust. A self-registering tide gage will be established at Nassau and be maintained for at least a year by the United States Coast and Geodetic Survey. The Department of Agriculture has allowed the following officials to accompany the expedition, namely, Dr. Oliver L. Fassig, Section Director, United States Weather Bureau, in charge of observations on climatology and physics, and Messrs. C. M. Mooney, J. C. Britton, and E. C. Hughes, who will conduct a soil survey. The National Museum will send Mr. Barton Bean, curator of fishes, who will conduct the work in marine zoology. Dr. Fassig carries several kites for special aerial exploration and will also conduct magnetic observations; he will be assisted by Mr. J. E. Routh. Geology, botany, medicine, and other branches of science are represented by the other members of the party.

Such expeditions as these for geographic exploration and scientific observation give an immense stimulus to the progress of science. Every university profits by encouraging such work. The earth, its atmosphere, and its inhabitants can be properly studied only in proportion as we travel and learn to take a comprehensive view of the whole globe.

MISCELLANEOUS ITEMS.

The Sierra Club of San Francisco has organized an excursion to the summit of Mount Whitney. Prof. Alexander G. McAdie, of the United States Weather Bureau; Prof. Gifford Pinchot, of the Bureau of Forestry, and Dr. G. K. Gilbert, of the United States Geological Survey, will accompany it. It is hoped that Professor McAdie will be able to establish maximum and minimum thermometers on the summit, so that a year hence we may have a record of the extremes of temperatures that have occurred there.

Mr. A. F. Osler, the inventor of the self-recording pressure-plat anemometer, established at many stations in England, died on April 26, near Birmingham, England, at the advanced age of 95. He was a Fellow of the Royal Society of London (1855) and one of the founders of the Royal Meteorological Society (1851).

An international kite competition will be held on the Sussex Downs on June 25.

The Berlin Society for the study of the globe (*Gesellschaft für Erdkunde*) will celebrate its 75th anniversary on May 4. This society has greatly furthered the progress of meteorology.

When Captain Colbeck discovered the position of the *Discovery*, his own vessel, the *Morning*, was eight miles distant, and a floe of ice prevented any nearer approach. Therefore, coal and provisions were transferred by means of sledges. The *Discovery* is only provisioned until January, 1904, so that a second relief expedition will be necessary.

The *Fram*, under the command of Captain Sverdrup, reached Norway on September 12, 1902, after an absence of four and a quarter years, during most of which time she was locked up in the great Arctic ice fields. The most northerly point attained was 81° 40' north, in latitude 94° west, and Captain Sverdrup thinks it unlikely that land will be discovered in that region. Meteorological observations were taken every second hour during the four years.